Comparison of UUnifast and DRS Tasksets on Dynamic Task Scheduling Algorithms

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Abstract – This article provides a comparison between evaluations between tasksets generated by UUniFast and DRS respectively, on various Dynamic Task Scheduling Algorithms.

UUnifast: So, for UUniFast suspension time ['sslength'] is drawn uniformly from the interval between the minimum suspension length value and maximum suspension length value. We have the following three setups:

1. Short Suspension [0.0(Ti - Ci), 0.2(Ti - Ci)]
2. Moderate Suspension [0.2(Ti - Ci), 0.4(Ti - Ci)]
3. Long Suspension [0.4(Ti - Ci), 0.6(Ti - Ci)]

Depending on the considered suspension models, the suspension time of each task is drawn accordingly

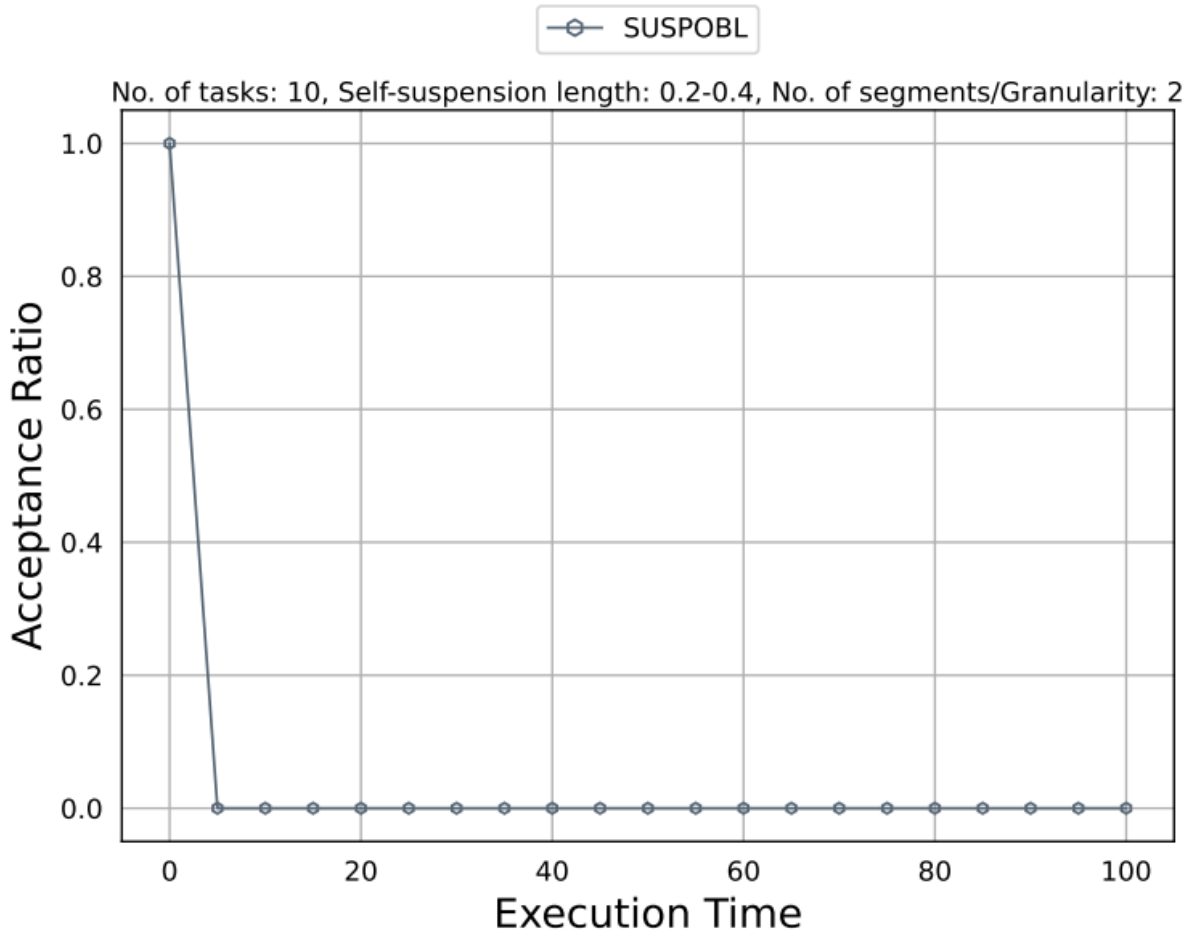
DRS: Unlike UUniFast, Dirichlet- Rescaling Algorithm are used for asymmetric constraints and works with separate upper bounds and lower bounds for each task.

1. Setup 1 (minsus+ex=0.1*number of tasks per set, maxsus+ex=1.0)
2. Setup 2 (minsus+ex=0.3*number of tasks per set, maxsus+ex=1.0)
3. Setup 3 (minsus+ex=0.5*number of tasks per set, maxsus+ex=1.0)

<u>Suspension Oblivious:</u> Here we will see how a Dynamic Scheduling Algorithm (Suspension Oblivious) performs on different setups for UUniFast and DRS

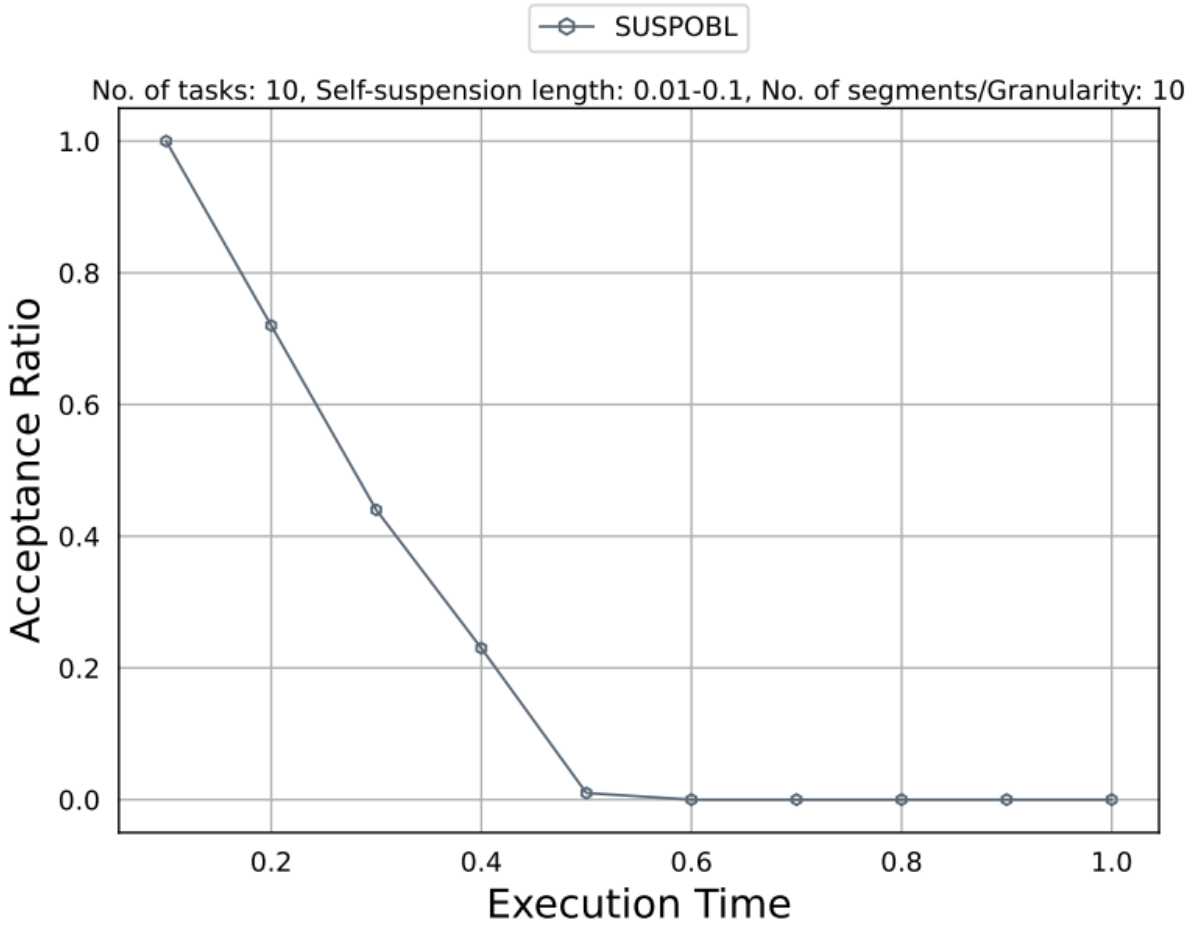
UUniFast 1st Setup: Short Suspension [0.0(Ti - Ci), 0.2(Ti - Ci)]

UUniFast 2st Setup: Moderate Suspension [0.2(Ti - Ci), 0.4(Ti - Ci)]


SUSPOBL
No. of tasks: 10, Self-suspension length: 0.2-0.4, No. of segments/Granularity: 2
Acceptance Ratio
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
Execution Time

UUniFast 3rd Setup: Long Suspension [0.4(Ti - Ci), 0.6(Ti - Ci)]

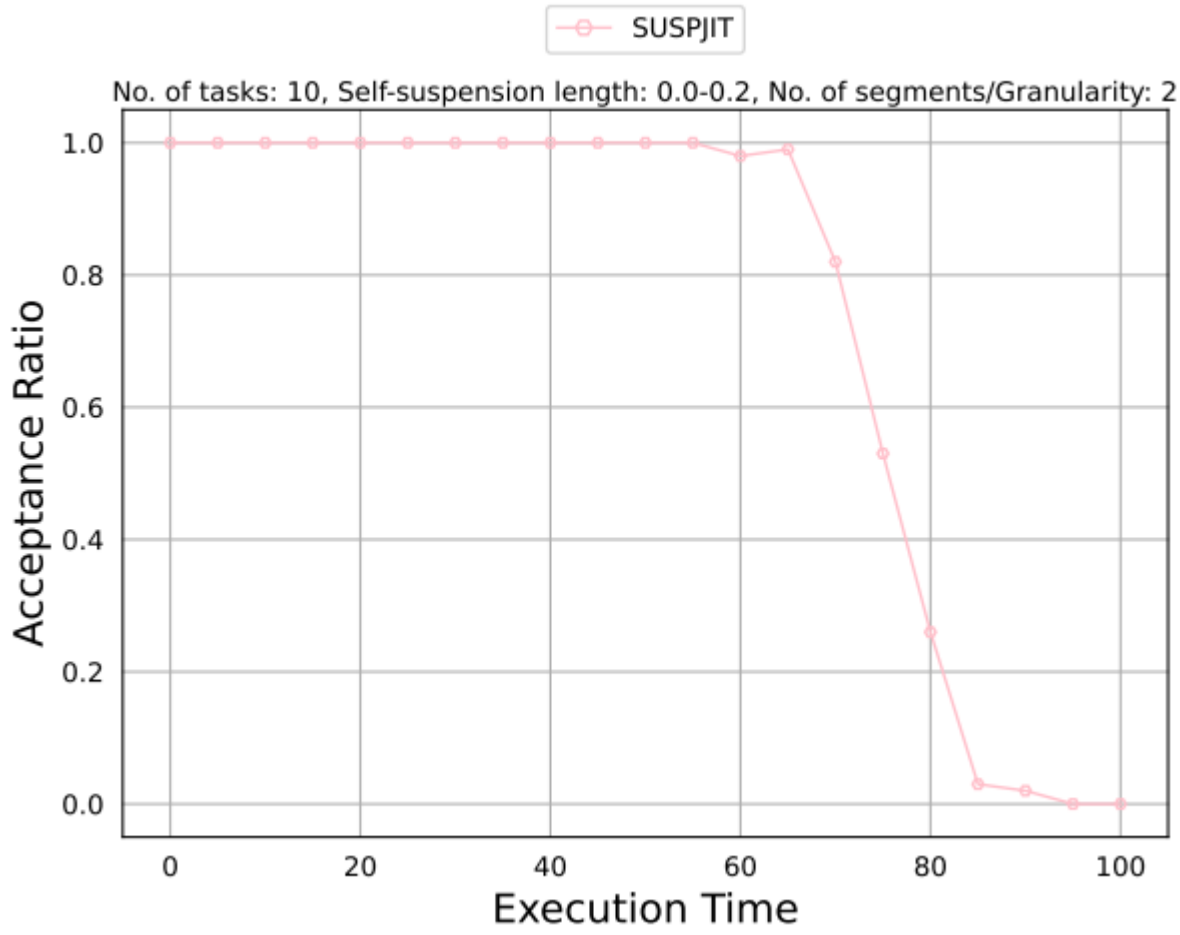
DRS 1ST Setup:



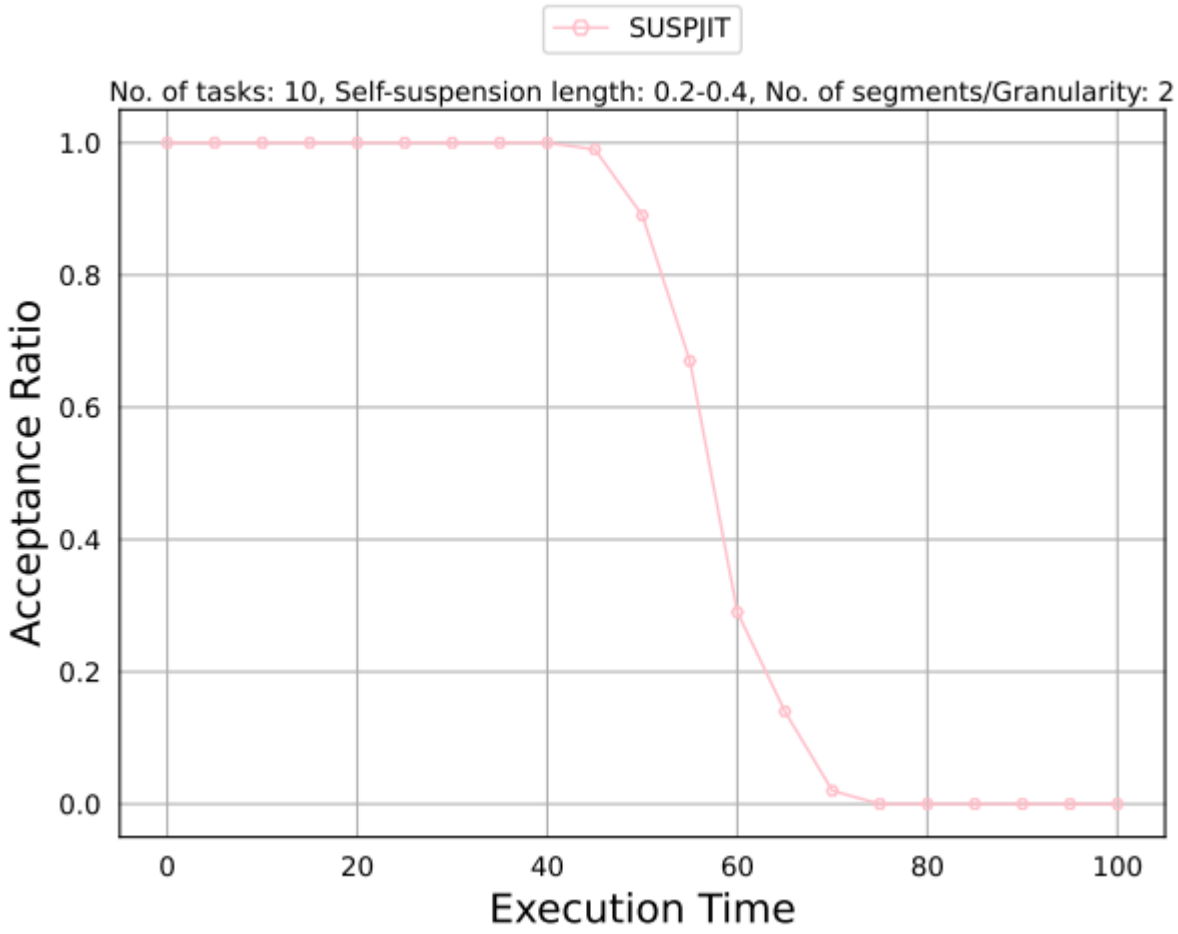
DRS 2nd Setup:

Suspension Jitter:

UUniFast 1st Setup: Short Suspension [0.0(Ti - Ci), 0.2(Ti - Ci)]



UUniFast 2st Setup: Moderate Suspension [0.2(Ti - Ci), 0.4(Ti - Ci)]


SUSPJIT
No. of tasks: 10, Self-suspension length: 0.2-0.4, No. of segments/Granularity: 2
Acceptance Ratio
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
Execution Time

UUniFast 3rd Setup: Long Suspension [0.4(Ti - Ci), 0.6(Ti - Ci)]